

### Abstract of the Disclosure

A network is maintained functional in the presence of a wide range of faults, including physical fiber cuts, transmission impairments creating signal quality degradation, and failure of equipment modules, for example, transceivers, using a common control and backup channel, either alone or in combination with fiber loopback protection or wavelength loopback protection, or fiber loopback protection or wavelength loopback protection alone. Systems constructed according to the invention require only a single transceiver per wavelength at each node that accesses that wavelength. The invention is equally applicable to type 1 nodes, which drop and add a single, predetermined wavelength, and to type 2 nodes which have the capability to drop and add any subset of the wavelengths employed in the network.